# VSB FY2019-2020 Funded Projects

**Eastern Virginia AREC Soybean Research Support**

Project Leader: Joseph Oakes

Total Budget: $7,500

Total Amount Funded: $7,500

Timeliness of the completion of various tasks that are a part of research programs is very important to their success. Many times, observations such as maturity dates and disease ratings must be done at a certain time or the opportunity will be lost. This project will make a significant contribution to the overall success of the soybean research programs at EVAREC, which in turn will benefit soybean producers by providing accurate research-based information to assist them in management of their soybean crop.

**Site-Specific Practices for Profitable Virginia Soybean**

Project Leader: David Holshouser

Total Budget: $46,806

Total Amount Funded: $46,806

Average soybean yield response to seeding rate does not consider environmental variation. Detailed analysis and understanding of how environmental conditions affect soybean growth and development is needed. Probability tables predicting yield response to planting date and relative maturity need annual updates. Varieties commonly used by farmers need to be included in the soybean OVT. More electronic means of communication is needed, especially that which is smart-phone compatible. I assist researchers of worthy projects in conducting experiments, publication of farmer-friendly extension-type articles, and other technology transfer. I learn and network with farmers, Extension, researchers, and crop advisers at the Commodity Classic and other professional meetings. Communication and involvement with the Virginia Soybean Board, United Soybean Board, and Virginia Soybean Association is necessary for good research and extension programing.

**Virginia Soybean Association Education and Promotion**

Project Leader: VSA Executive Director, TBD

Total Budget: $215,963

Total Amount Funded: $218,963

The Virginia Soybean Association's goal is to education consumers about soybeans and soybean production, through a variety of educational and promotional programming. VSA seeks to increase awareness of soybean uses, soybean production and their economic impact. VSA programs also include

education about biodiesel, soy health benefits, new uses for soy and sustainable soybean production practices utilized to protect the environment. VSA seeks to provide leadership and networking opportunities for Virginia soybean growers.

Atlantic Soybean **Council**

Project Leader: Ellen Matthews Davis

Total Budget: $5,000

Total Amount Funded: $5,000

The Atlantic Soybean Council works to identify gaps and duplications in soybean research in Virginia, Maryland, Delaware, Pennsylvania, New York and New Jersey. Once these gaps and duplications are identified, synergies among researchers are created and limited checkoff funding is leveraged for maximum impact.

**Improving Seedling Emergence of Value-Added Low Phytate Soybeans**

Project Leader: M. A. Saghai Maroof

Total Budget: $25,090

Total Amount Funded: $19,000

Soymeal is a major feedstock in the poultry and swine industries. Feeding trials have shown that low phytate (lpa) grain can increase the available phosphorous to animals, satisfying more of their dietary requirement. Improving the nutritional value of soybean seed by reducing seed phytate (PA) and stachyose content would result in a significant reduction in phosphate loads to receiving bodies of water, while improving feeding value of soybean meal.

**Sulfur and Micronutrient Fertility for High-Yielding Soybean Production in Virginia**

Project Leader: Mark S. Reiter, Ph.D.

Total Budget: $44,068

Total Amount Funded: $18,258

Virginia will collaborate with researchers from OH, IN, MN, NC, AR, LA, GA, and WI on a multi-state project to evaluate the response of soybean to sulfur (S) and micronutrient fertilization. Individual states will request funding from their State Qualified Soybean Boards (QSSB). The Extension network lacks information related to utility of S application in soybean. Likewise, most states do not have specific micronutrient recommendations and companies are consistently developing and recommending micronutrient products with Extension lacking information to make informed recommendations. The

overall objective of this research project is to assist producers with management decisions regarding S and micronutrient deficiencies and yield responses as they relate to soybeans.

**Nematode Management in Virginia Soybean**

Project Leader: Hillary Mehl

Total Budget: $20,000

Total Amount Funded: $15,000

Planting in nematode-infested fields can result in significant damage to soybean crops in Virginia. Before best management practices can be implemented for nematodes impacting soybean and other crops, nematode populations must be characterized. In addition, the efficacy of specific management recommendations, including host resistance and nematicides, needs to be determined for the specific nematode populations present in the region.

**Development of Improved Soybean Varieties and Germplasm Adapted to Virginia**

Project Leader: Bo Zhang

Total Budget: $56,669

Total Amount Funded: $42,500

Climate change and unexpected weather make it more difficult for farmers to predict yield and yearly income because of the highly variable response of currently available varieties and hybrids. Soybean varieties specifically bred, developed, and selected by breeders for Virginia will perform better under Virginia ever-changing weather conditions. However, commercial soybean cultivars released by private companies may not be well adapted to Virginia because Virginia is not their breeding selection location. Virginia Tech's public soybean breeding program needs to release superior cultivars to fulfill the growers' need and reduce their seed cost in order to increase their farming income.

**Development of Soybean Varieties and Germplasm with High Protein Digestibility**

Project Leader: Bo Zhang, School of Plant and Environmental Sciences, Virginia Tech

Total Budget: $56,000

Total Amount Funded: $42,000

Soybean meal has been widely used in animal feed including swine, poultry, cattle, horse, sheep and even fish. However, soybean has several anti-nutritional factors such as trypsin inhibitors, phytic acid, raffinose family of oligosaccharides, and antigenic factors that prevent animals' protein digestibility. Processing of soybean meal requires extra processing steps add cost to soybean meal production. The most economic and reliable way to improve animals' protein digestibility is to feed them with soybean

meals containing low concentration of anti-nutritional factors. No such commercial soybean variety is available for growers and end users.

**Soybean-Based Rotations for Virginia**

Project Leader: David Holshouser

Total Budget: $10,000

Total Amount Funded: $10,000

Soybean is the most valuable and occupies more acreage than other row crops in Virginia. The main rotational crop for soybean is corn and soybean are frequently double cropped after small grain. Cover crops are often integrated into our rotations. Cover crops and double cropping improves soil quality by adding more crop residue to soil than mono-cropping system and by encouraging continuous no-till. It also minimizes off-site impacts due to leaching or runoff of sediment and fertilizers. It is important that rotational systems for soybean are compared for yield, profitability, and environmental value over time. To have the most impact, research comparing these systems must be conducted over many years. Many universities have long-term (10 to 100 years) experiments, but Virginia Tech does not. An overarching goal to develop sustainable cropping systems that are productive, profitable, and improve soil quality. The goal of this project is to establish and maintain a long-term soybean rotation experiment that compares crop yields, profitability, and environmental impacts at the Tidewater AREC.

**Disease Management in Virginia Soybean**

Project Leader: Hillary Mehl

Total Budget: $10,000

Total Amount Funded: $10,000

Foliar fungicide use in soybean has increased over the past decade due to actual and perceived disease threats (i.e., soybean rust), introduction of new fungicide chemistries, and increased commodity prices that encourage high input/high yield crop production. However, foliar fungicides are not always effective or profitable due to several factors including a lack of environmental conditions that are conducive for disease development and the presence of fungicide resistant pathogens. The overall goals of this project are to provide a weather-based fungicide advisory to growers and to generate data-based management recommendations that will improve the effectiveness of disease control and profitability of soybean production.

**Best management practices for insect pests in Virginia soybean**

Project Leader: Sally Taylor

Total Budget: $20,000

Total Amount Funded: $15,000

We want to help Virginia soybean growers minimize yield losses and reduce costs associated with insect pest management by shaping recommendations appropriate to early and late planted targeted soybean maturities. We also want to equip producers with the tools and knowledge to scout insect pests. To accomplish this, we propose to 1. Evaluate insect management strategies, including integrated pest management (IPM) approaches, that consider insecticide selection and spray termination timing. 2. Calculate the economic trade-offs between IPM recommendations and standard management plans. 3. Make beat cloths, provide them to growers, and demonstrate how to scout for insect pests.

**Learning to Serve the Soybean Industry Project Leader: Ozzie Abaye**

Total Budget: $7,000

Total Amount Funded: $7,000

To give students a strong background in crop analysis, specifically plant and seed identifications, seed analysis, and commercial grain grading. Students will learn the importance of identifying over 500 plant and seeds that have tremendous economic importance for the agricultural sectors; Students will develop understanding of how communities address the challenges of growing crops to meet the nutrition, food security, and health needs of its population; Be aware of grain market/cost driving factors (rainfall, demand, any other environmental and physical factors) Students will identify future career opportunities in community development to promote healthy, resilient and sustainable food and agricultural systems, policies and programs that promote the soybean industry.

**Virginia FFA Agronomy Events**

Project Leader: Jennifer H Armstrong

Total Budget: $7,500

Total Amount Funded: $7,500

The Agronomy Career Development Event (CDE) offers FFA the opportunity to see our mission in action, by providing over 70 students the chance to gain knowledge and experience as they pursue careers in the field of agronomy. By networking with industry experts, judges, extension specialists and each other, the junior and senior agronomy CDE participants are exposed to the latest developments in the field of agronomy while developing team-building skills. This event demonstrates the value of pursuing a career in production agriculture.

The Virginia FFA Association hosts an annual Career Development Event (CDE) focused on developing agronomy and crops evaluation skills of FFA members. Approximately 20% of the contest is directly related to identification and classification of soybeans for seed or feed production. The objectives of this event and the Fiber and Oil Crop Proficiency award are: To provide an opportunity for FFA members to display their knowledge of agronomic sciences while evaluating and demonstrating their skills in this area through competition - To encourage FFA members to explore meaningful connections between classroom education and career opportunities in the agronomy industry; and, - To recognize honor FFA members who, through their Supervised Agricultural Experience (SAE), have developed specialized skills that they can apply toward their future careers (Proficiency Award).

**Use of Genomics to Develop Disease Resistant Soybeans**

Project Leader: M. A. Saghai Maroof

Total Budget: $29,000

Total Amount Funded: $21,000

Diseases are major constraints for soybean production. Phytophthora root and stem rot, caused by Phytophthora sojae, is the second most important disease problem after soybean cyst nematode. Pythium damping-off and root rot is another soybean disease which results in poor stands and reduces yield. Recent disease screenings have identified 55 Pythium species. Host resistance is the most cost-effective way to manage these soybean diseases. However, resistance genes become ineffective as the pathogen populations change over time. This project aims at identification of new and novel disease resistance genes and their associated DNA markers. Improved germplasm from this study should facilitate development of superior soybean cultivars for domestic and export markets and improve profitability of US soybean producers.

**"Sprouting Success" and AITC Educational outreach Support**

Project Leader: Kelly Pious

Total Budget: $18,000

Total Amount Funded: $15,000

Soybeans are a key focus throughout the many facets of Virginia Agriculture in the Classroom (AITC) programming. From curriculum covered at educator professional development training to volunteer activities for community events and direct-to-student STEM initiatives, AITC covers the production and processing of soybeans here in the Commonwealth. For the 2019-2020 year, AITC requests support of $18,000 for professional development training, volunteer resources, and the update and reprinting of 1,500 copies of AITC's core curriculum unit, Sprouting Success.

**Herbicide and Integrated Soybean Weed Management 2019**

 Project Leader: Michael Flessner

Total Budget: $20,359

 Total Amount Funded: $20,359

Project Summary: Objective 1) Cover crops for common ragweed and Palmer amaranth management. This objective will evaluate common questions about using cover crops for weed suppression Can I just plant wheat or do I need cereal rye? Do I need to roll to cover crop or can I leave it standing? How much good is the cover crop doing for weed suppression? The experiment will evaluate combinations of the following cereal rye versus wheat residue; rolled residue versus left standing; and no, low, medium, or high biomass levels for a total of 13 treatments in 2 locations. Palmer amaranth and common ragweed germination and establishment data will be collected in addition to light penetration, cover crop biomass at termination. Objectives 2 and 3) Palmer amaranth and common ragweed control with alternatives to glyphosate and ALS herbicides to mitigate PPO resistance program herbicide approaches and post emergent herbicide approaches. Common ragweed and Palmer amaranth survival and seed production will be evaluated from various postemergence herbicides (objective 2) and herbicide programs (preemergence followed by postemergence; objective 3) These data programs (preemergence followed by postemergence; objective 3). These data will be useful to establish research-based recommendations to mitigate PPO resistance and spread thereof into Virginia. The information gleaned from this research will be incorporated into Extension activities including web-based information, presentations, and field day demonstrations. Producers may then implement weed management changes/recommendations as they see fit.


**On-farm Investigation and Evaluation of Soybean Production Strategies for 2019**

Project Leader: Scott Reiter

Total Budget: $9,750

Total Amount Funded: $9,750

On-farm, research-based production information is used by soybean producers in Virginia to achieve maximum economic yields and increase farm profitability. Agriculture Extension Agents with Virginia Cooperative Extension will continue replicated, on-farm research trials across Virginia in 2019 using producer-cooperator partnerships. In addition to soybean variety trials at multiple Eastern Virginia locations, additional research will be conducted on-farm to address producer-identified challenges and evaluate management strategies. Results will be summarized in an Extension publication and distributed at producer meetings in the winter of 2020.